

# Fiber Optic Mass Flow Gauge for Liquid Cryogenic Fuel Facilities Monitoring and Control, Phase I

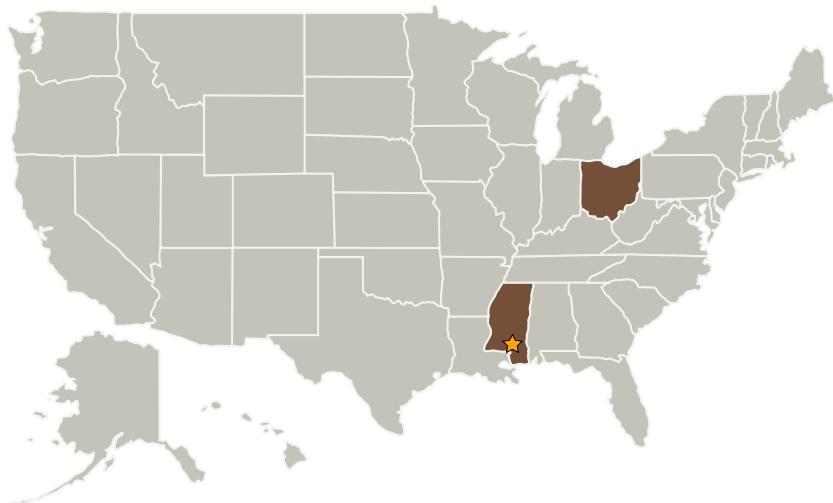
Completed Technology Project (2007 - 2007)



## Project Introduction

This SBIR Phase I proposal describes a fiber optic mass flow gauge that will aid in managing liquid hydrogen and oxygen fuel storage and transport. The increasing use of hydrogen as a fuel places the safety of facilities and personnel at the forefront of concern, making an explosion proof fiber optic system a desirable option. Further, the actual available fuel can depart significantly from the expected quantity due to variable boil-off and leak rates and inaccurate measurements. Measurement accuracy can be complicated by low gravity, stratification of the liquid density and temperature, the presence of a gas phase, the wetting of tank surfaces by the liquid and the lack of suitable sensors and instruments. The Phase II objective is to deliver a prototype that will withstand the high pressures and flow rates at liquid hydrogen and oxygen temperatures demanded by rocket propulsion systems.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
Lake Shore Cryotronics, Inc.	Supporting Organization	Industry	Westerville, Ohio



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Stennis Space Center (SSC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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## Primary U.S. Work Locations

Mississippi

Ohio

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.3 In-Situ Instruments and Sensors
    - └ TX08.3.5 Electromagnetic Wave Based Sensors